

Supplementary Table 1. Characteristics and Results of Reviewed Studies

	Sample size		Age (Mean;range)		Gender Ratio (M/F)		RS Scan Length (min:sec)	Exclusion for Motion (Y or N)		Global Signal Regression (Y or N)	Analysis Approach	Higher (MCI>HC)	Reduced (HC>MCI)	No Significant Difference (HC~MCI)
	MCI	HC	MCI	HC	MCI	HC		Participants (#excluded)	Time point					
ALFF/ReHO/COSLOF														
Li et al. 2002 ⁵⁶	6	13	67.5	70	1.5	.50	6:00	Y(9)	N	N	COSLOF	none	HC	none
Bai et al. 2008 ⁷⁶	20	20	71.3	69.4	1.0	.82	7:06	N	N	N	ReHo	R IPL, R FG, and B putamen	B PCC, L PCu, L MFG, L IFG, R ACC, R STG, R parietal lobule/PCG, R and L cuneus	does not state
Han et al. 2011 ³⁵	24	24	65.1; 41-81	64.7; 50-79	.60	1.0	7:58	Y(2)	N	N	ALFF and fALFF	ALFF: B LG/FG/Calcarine Cortex, R STG. Higher fALFF: B LG, Calcarine Cortex/FG, L precentral gyrus/PCG.	PCC/PCu, orbital frontal gyrus, mPFC/ACC, L ITG, L IFG and MFG, B insula. PCC/PCu, R HC/PHG/basal ganglia.	Does not state.
Wang et al. 2011 ⁶⁴	16	22	69.38	66.55	.78	.47	7:58	Y(5)	N	N	ALFF	none	B PCC/PCu, B SFG, L PCG, L FG, R Inferior Occipital Gyrus, R ITG	L IPL, L MFG, L Lentiform Nucleus, Paracentral Lobule/SFG/Supplemental Motor Area
Zhang et al. 2012 ⁵¹	19	21	76	70	1.1	1.3	6:40	Y(9)	N	N	ReHo	L IPL	none	mPFC, L and R PCC/PCu
Liu et al. 2014 ⁴³	18	21	70.2	65	1.3	.50	6:00	Y(5)	N	N	ALFF and ReHo	none	none	mPFC, Premotor Cortex, PCu, and lateral temporo-parietal cortex
Zhang et al. 2017 ⁷¹	32	40	68.91	66.35	0.78	0.67	7:58	Y(3)	N	Y	ReHo	Local connectivity: L Precentral gyrus, L Postcentral sulcus.	Local connectivity: L Postcentral sulcus Remote connectivity: R PCC → L	none

Remote connectivity: R PCC → L Central sulcus, R PCC → R Central sulcus, R PCC → R Precentral gyrus

PCu/PCC

Graph Theory

Liu et al. 2012 ⁷⁷	16	18	68.5; 54-81	64.9; 49-78	1.3	1.3	8:20	Y(0)	N	N	GT	Centrality of Calcarine Cortex, inferior occipital gyrus, SFG	Centrality of AG, Heschel's gyrus, HC, superior parietal gyrus	Path length, clustering coefficient
Wang et al. 2013a ⁹⁴	37	47	66.8; 41-79	63.4; 50-79	.85	.74	7:58	N	N	N	GT	Path length, normalized path length (globally)	Modularity; Decreased nodal strength in 27 regions, 70% of these in default mode network	small-world topology; modular structure; pattern of nodal strength greatest in parietal / occipital
Wang et al. 2013b ⁹⁵	25	26	64.28	62.35	.92	.85	8:00	N	N	N	GT/ROI	none	none	mPFC, ACC, the inferior and middle temporal regions, AG, PCC, and PCu; global and local efficiency
Chen et al., 2016 ⁹⁶	87	114	68.92	67.36	1.18	0.78	8:00	Y(4)	N	N	GT	L ant IPS - L MC	none	all other pairwise correlations between 36 seeds?
Wang et al. 2017 ⁶⁵	66	90	69.5	67.85	1.36	1.09	8:00	N	N	N	GT	none	Eigenvector Centrality R MTG/HC (BA 21) L SFG/MFG (BA 9/10/46) B vACC/vMPFC (BA11) B RSC (BA29)	Degree Centrality R MTG/HC (BA 21) L SFG/MFG (BA 9/10/46) R PLC (lobule VI/Crus I)

Granger Causality & Other

*Yu et al. 2017 ³⁶	14	18	68.79	73.78	1.80	0.50	NA	N	N	Y	GCA	none	L Thal, L Insula, L PHC, L Superior medial frontal gyrus	R Lingual gyrus, L Parietal
*Yu et al., 2017b ⁷⁸	26	58	71.64	69.87	0.63	0.98	8:04	Y(14)	N	N	GCA	PCC→B PCu/postcentral gyrus	PCC→R cerebellum; PCC→R SFG; L putamen→PCC; L caudate→PCC; L SPL→PCC	does not state

Lee et al, 2016 ⁵⁷	37	22	72	70	1.31	0.57	5:00	N	N	N	Other: Sparse SPM	none	PCC	does not state
*Li et al, 2016 ⁶⁶	31	42	67.9; 50-82	65.6; 51-79	0.82	0.56	7:58	Y(0)	N	Y	Other: Voxel- based functional connectivit y strength	none	B PCu /PCC, B LG, L middle occipital gyrus	Everywhere else, including some regions where AD was different from HC but no MCI difference from HC

Independent Components Analysis														
Zhou et al. 2008 ³⁰	10	13	68.89	65.92	1.5	.30	4:16	N	N	N	ICA	none	HC region→whole brain	Number of fiber bundles from PCC→HPC or PCC→Whole Brain
Oghabian et al. 2010 ³²	11	15	68	70	.83	1.1	3:20	N	N	N	ICA	PCC intensity	PCC cluster size	none
*Qi et al. 2010 ⁷²	14	14	71.8	70.4	.75	.75	8:04	N	Y	N	ICA	L SFG, L dmPFC, L IPL, L MTG	B PCC/PCu, R IPL, R FG	R FG, MTG, MTL, B Medial Dorsal thalamic/pulvinar activity
*Bai et al. 2011 ⁹⁷	26	18	71.4	70.3	2.7	1.3	7:06	Y(NA)	N	N	ICA	R and L PCC/PCu. B SFG/MFG, L MFG/IFG	none	IPL, PFC, ventral ACC, LTC
*Gili et al. 2011 ⁵⁸	10	10	71.2; 4.1?	64.1; 10.5?	1.5	2.3	7:20	N	N	Y	ICA	none	PCC and mPFC→ACC, PCC and mPFC→SFG, mPFC→PCC	Does not state?
Gour et al. 2011 ³¹	13	12	72	72	2.3	1.4	11:00	N	N	Y	ICA	none	none	PCC/PCu, IPL, LTC, Premotor cortex, and Parahippocampal Cortex
*Agosta et al. 2012 ⁶⁷	12	13	69.1	68.5	1.0	.63	10:00	N	N	N	ICA	none	PCu	L PCC/PCu, R and left IPL/AG, pregenual ACC, R dlPFC. MCC, R and L IPL, L AG, L and R dlPFC
*Binnewijzend et al. 2012 ⁴⁴	23	43	71	69	.65	.53	10:00	N	N	N	ICA	none	none	L and R PCu, PCC

*De Vogelaere et al. 2012 ⁷⁹	16	16	67.2	62.1	1.0	1.7	6:15	N	N	N	ICA	B Superior Medial Gyrus, B AG, L MFG, R MTG and R medial temporal pole, and L medial temporal pole	B MFG, L MTG, L IFG, L IPL, L PCG, R middle orbital gyrus, SPL, L STG, L rolandic operculum, L insula, R SFG, R calcarine gyrus, L MFG, L HC	does not state
*Jin et al. 2012 ⁸⁰	8	8	60.88	60.63	.60	1.0	9:36	N	N	N	ICA	B MCC, B mPFC, L Inferior Temporal Lobe	L and R PFC, L HC, HC, p PHG, FG, PCC/retrosplenial cortex/PCu, L MTG, R AG	does not state
Koch et al. 2012 ²⁷	17	21	74.6; 60.4- 89	68.6; 56.4- 83	1.4	.91	4:50	N	N	N	ICA, VOI and discriminant analysis models.	none	none	ACC, PCC, L and R Lateral Parietal Cortex, R and L SFG, L and R Medial Temporal Cortex, L and R HC
*Cha et al. 2013 ⁶⁸	34	62	68.4	68.5	1.1	.38	5:00	N	N	N	ICA	none	L PCC, PHG	MFG, IPL, and MTG
*Esposito et al. 2013 ³⁴	13	24	60-80	60-80	NA	NA	5:00	N	N	N	ICA	PCC, L IPL	none	mPFC, R IPL
*Hahn et al. 2013 ⁵⁹	28	26	69.5	65.5	1.0	.63	10:00	N	N	N	ICA, IBN, ROI, and DTI	none	posterior parietal cortex	does not state
Li et al. 2013 ⁸¹	17	17	70.5	67.9	1.1	.70	6:40	Y(0)	N	Y	Combined group ICA and BN	R LTC→R IPL	dmPFC→L IPL, dmPFC→R IPL, R LTC→vmPFC	R HC, L HC, PCC
*Song et al. 2013 ⁶⁰	18	21	70.2	65	1.3	.50	6:00	Y(5)	N	N	ICA	none	PCC	does not state
*Wang et al. 2013c ⁴⁶	18	16	73.7	70.7	.80	.33	6:02	N	N	Y	ICA	none	R HC, R hippocampal gyrus, R thalamus	R PCu
*Yan et al. 2013 ⁸²	18	18	66.7; 50-81	64.9; 49-78	1.6	1.3	8:20	Y(0)	N	N	ICA and mGCA	L lateral PFC, B dmPFC, L ACC, B vmPFC, B MTG, and L IPL	PCu/PCC→ HC, PCu/PCC→IPL, PCu/PCC→lateral PFC, B PCu/PCC, B FG, R HC, and B IPL. PCu/PCC→HC, PCu/PCC→IPL, MTG→HC,	MTG, FG, HC

															MTG→FG, FG→HC)
Castellazzi et al. 2014 ²⁹	12	16	70	69	.20	.60	5:00	Y(14)	N	N	ICA	limbic, parieto-occipital cortex	parietal cortex, occipital cortex	temporal cortex, cerebellum	
*Adriaanse et al. 2014 ⁴⁵	12	18	68	67	5.0	3.5	9:30	Y(NA)	N	N	ICA	none	none	PCC and mPFC	
*Pasquini et al. 2015 ⁵⁴	22	22	65.3; 48-80	66.3; 56-85	1.0	.38	10:00	N	Y	N	ICA	Anterior HC	none	Anterior HC, PCC, and PCu	
*Yi et al. 2015 ⁷³	20	12	70.95	71.75	.25	.33	9:00	N	N	N	ICA	L PCu, R SPL, R STG, L MTG, and L culmen	L LG	does not state	
*Bharath, 2016 ⁷⁴	48	48	67.22	65.89	0.37	0.37	7:00	N	N	N	ICA	R paracingulate gyrus, R frontal pole	L paracingulate gyrus	does not state	
Chen, 2016 ⁵²	16	18	63.25; 52-77	66.06; 52-77	NA	NA	NA	Y(0)	N	NA	ICA	none	B PCu / PCC	does not state	
*Barban et al. 2017 ⁵⁰	26	29	72.1	70.5	1.40	0.39	7:20	N	N	Y	ICA	L PSG, B Pcu	none	does not state	

Seed-based															
*Bai et al. 2009 ⁷⁵	30	26	72.5	71.6	1.0	.86	7:06	Y(11)	N	Y	SB	PCC→L SFG, L IFG, MFG, PCC→L ITG	PCC→B MTG, PCC→R FG	does not state	
*Han et al. 2012 ⁹⁸	40	40	65.1; 41-81	64.7; 50-79	0.6	1.0	8:00	Y(2)	N	Y	SB (PCC)	PCC→L fusiform, PCC→L rectal, PCC→R inferior frontal, PCC→L precentral	PCC→L and R orbital frontal, PCC→R middle frontal, PCC→L putamen, PCC→R caudate, PCC→L superior temporal, PCC→R posterior cingulate	does not state	
*Liang et al. 2012 ⁶¹	16	16	68.5	67.19	.60	.60	7:58	Y(0)	N	Y	SB	none	AG, L MTG, R MFG, R IPL/PCu.	does not state	
*Wang et al. 2012 ⁶²	14	14	69.64	68.07	1.3	1.3	7:58	Y(0)	N	Y	SB (PCC region)	none	PCC→ITG, PCC→MTG, PCC→STG, PCC→mPFC,	does not state	

														PCC→ SFG, PCC→MFG, PCC→ACC, PCC→PCu, PCC→AG, PCC→ thalamus
*Zhu et al. 2013 ⁶⁹	11	12	77.1	73.8	.38	1.4	7:00	Y(0)	N	Y	SB	none	R ICC→ R cingulum, R ICC→mPFC	R ICC→STG, MTG, Supramarginal Gyrus, AG, IPL, L Cingulate Gyrus, PCC, and PCu; L ICC→R HC, R PCC, L PCC/PCu, L SFG.
*Gardini et al. 2015 ⁴⁹	21	21	70.62	69.75	1.6	.50	6:14	N	N	Y	SB	mPFC→B PCC, PCC→R Parahippocampal Cortex, PCC→anterior HC	none	none
Zhou et al. 2015 ²⁸	17	14	76.7	76.3	.47	.36	7:00	N	N	N	SB and fALFF	none	mPFC; fALFF: temporal cortex	PCC and cerebellum
*Joo, 2016	50	50	71.2	72.1	0.79	0.85	5:00	N	N	N	SB	B DLPFC→R supramarginal gyrus, B DLPFC→L MTG	PCC→R ACC, PCC→B PCC	does not state
*Zhu, 2016 ⁷⁰	19	28	65.7	63.8	0.58	0.65	7:00	Y(11)	Y(NA)	Y	SB	none	IPS→L postcentral gyrus; Ant. insula→PCC; Ant. insula→MFG; Ant insula→sup. occipital gyrus; DLPFC→R MFG; DLPFC→R SFG	DMN (intra and internetwork)
McKinnon et al. 2017 ³³	32	15	68.25	65.2	0.41	0.13	6:00	N	N	N	SB	none	R posterior inferior parietal → L Retrosplenial cortex L TempPole → L PHC L TempPole→ R HC	does not state
ROI														
*Sorg et al. 2007 ⁶³	24	16	69.3;	68.1;	1.2	1.7	4:00	N	N	N	ROI and ICA	none	L PCC, R mPFC, and B two small	does not state

*Liang et al. 2014 ⁵⁵	16	16	68.5	67.19	.60	.60	7:58	Y(0)	N	N	ROI (effective connectivit y)	L PHG→dmPFC, R PHG→dmPFC, PCC →Orbital frontal cortex/ventral ACC, Orbital frontal cortex/ventral ACC →dmPFC, L Inferolateral Temporal Cortex →dmPFC, L Inferolateral Temporal Cortex→R posterior rIPL	none	clusters in the parietal cortex. B SPL, R PFC	L and R posterior IPL, L and R dlPFC	
McKinnon, 2016 ⁴⁷	57	38	72.3; >65	NA	1.71	NA	6:30	Y(NA)	Y(NA)	Y	ROI	none	none	all pairwise correlations between 20 DMN ROIs		
Tam, 2016 ³⁷	129	99	72.3	72	1.00	0.59	12:37	Y(27)	Y(NA)	N	ROI	none	Superior medial frontal cortex --> ventromedial PFC, striatum, thalamus, temporal lobes, HC, inferior parietal lobes, and PCu; dorsomPFC --> temporal lobe, ventral frontal, thalamus, striatum, cuneus; striatum --> sensorimotor cortex, thalamus, frontal and parietal; middle temporal lobe --> posterior cingulate, PCu, inferior parietal lobes, HC, and frontal	does not state		
Zhan, 2016: HC	26	23	71.2	74	0.63	1.09	7:00	Y(0)	N	N	ROI, GT	none	none	Nodal strengths in		

vs EMCI ⁴⁸													DMN	
Zhan, 2016: HC vs LMCI ⁴⁸	19	23	73.2	74	2.17	1.09	7:00	Y(0)	N	N	ROI, GT	none	none	Nodal strengths in DMN

Notes: M = male, F = female, L = left, R = right, B = bilateral. Analyses Approaches: ALFF: Amplitude of Low Frequency Fluctuations, fALFF: Fractional ALFF, COSLOF: coefficients of spontaneous low frequency, BN: Bayesian Network analysis, ICA: Independent Component Analysis, GT: Graph Theory, mGCA: multivariate Granger causality analysis, ROI: Region of Interest, VOI: Volume of Interest, ReHo: Regional Homogeneity, DTI: Diffusion Tensor Imaging; EMCI = early MCI, LMCI = late MCI

Brain Regions: PCC: Posterior Cingulate Cortex, PCu: Precuneus, SFG: Superior Frontal Gyrus, PCG: Post Central Gyrus, FG: Fusiform Gyrus, ITG: Inferior Temporal Gyrus, IPL: Inferior Parietal Lobule, MFG: Middle Frontal Gyrus, LG: Lingual Gyrus, STG: Superior Temporal Gyrus, mPFC: medial Prefrontal Cortex, ACC: Anterior Cingulate Cortex, IFG: Inferior Frontal Gyrus, HC: Hippocampus, PHC: Parahippocampal cortex; PHG: Parahippocampal Gyrus, LTC: Lateral Temporal Cortex, dmPFC: Dorsolateral Medial Prefrontal Cortex, vmPFC: Ventromedial Prefrontal Cortex, AG: Angular Gyrus, SPL: Superior Parietal Lobule, MTG: Medial Temporal Gyrus, PFC: Prefrontal Cortex, dlPFC: Dorsolateral Prefrontal Cortex, MCC: Medial Cingulate Cortex, ICC: Isthmus of the Cingulate Cortex

* Study included in meta-analysis

Supplementary Table 2. Summary of Methodological Features of Reviewed Studies

MCI/aMCI			HC			
	Minimum	Maximum	Average	Minimum	Maximum	Average
Sample Size	6	129	25.6	8	114	27.7
Age Lower bound	41	75	54.5	49	74	55.5
Age upper bound	77	94	82.2	73	94	80.5
Age average	60.9	86.3	70.0	60.6	86.3	68.5
Gender Ratio (M/F)	0.2	5	1.11	0.1	3.5	0.86

Scan Length Total (min): Min: 3.3 Max: 12.6 Average: 7.3

Exclusion for Motion: Yes: 30 For time-point: 5 For participants: 28 No: 27

Average number of participants excluded: 4.96

Global Signal Regression: Yes: 16 No: 40

Analysis Approach: 25 ICA 10 SB 5 GT 7 ReHo/ALFF/COSLOF 6 ROI 2 GCA 2 Other

Exclusion Criteria: 43 psychiatric/psychological or behavioral disorders or intellectual disabilities, 39 neurological diseases/disorders, 38 medical diseases/disorders, 15 left-handedness, 16 abnormalities on MRI, 13 history of TBI or head injury, 18 current abuse or history of drug or alcohol abuse, 14 current or past use of medication with neurological affects, 11 MRI incompatibilities, 8 MMSE score requirement not met, 5 age range requirement not met, 7 major hearing or visual impairment, and 10 other (including no informant, language requirement, illiteracy, education requirement, or inability to complete procedures)

NOTE: MCI = mild cognitive impairment, aMCI = amnestic MCI, HC = healthy comparison, Min = minimum,

Max = maximum, M = male, F = Female, ICA = Independent Component Analysis, SB = Seed Based, GT =

Graph Theory, ReHo = Regional Homogeneity, ROI = Region of Interest, ALFF = Amplitude of Low

Frequency Fluctuations, COSLOF = Coefficients of Spontaneous Low Frequency, MRI = magnetic resonance

Supplementary Table 3. Comparison of Study Characteristics Between Studies that Showed vs Did Not Show a Non-zero Group Difference Consistent with the Meta-Analysis for Each Cluster

	MCI>HC			HC>MCI		
	Cluster 1 ^a	Cluster 2 ^b	Cluster 7 ^c		Cluster 8 ^d	Cluster 9 ^e
Analysis type (Seed vs ICA vs Other)	$\chi^2(2) = 1.3$	$\chi^2(2) = .72$	$\chi^2(2) = 4.9$		$\chi^2(2) = .03$	$\chi^2(2) = 2.1$
MCI Sample Size	t(29) = 1.3	t(29) = -1.1	t(29) = 1.3		t(29) = -.27	t(29) = -.12
HC Sample Size	t(23) = 2.8*	t(29) = -.49	t(23) = 2.7*		t(29) = -.03	t(29) = -.70
MCI Mean Age (years)	t(28) = .99	t(28) = -.05	t(28) = -.38		t(28) = -.84	t(28) = .28
HC Mean Age (years)	t(28) = 1.2	t(28) = -.30	t(28) = -.77		t(28) = .24	t(28) = -.26
MCI Gender Ratio (male:female)	t(28) = -1.5	t(28) = -.28	t(3) = -1.2		t(28) = .93	t(28) = -1.0
HC Gender Ratio (male:female)	t(3) = -1.2	t(28) = .60	t(28) = .47		t(28) = .09	t(28) = -.68
Scan Length (min)	t(28) = 2.1*	t(28) = 2.6*	t(28) = 1.2		t(28) = .85	t(28) = 1.5
Motion_Exclusion (no vs yes)	$\chi^2(1) = 1.5$	$\chi^2(1) = 2.4$	$\chi^2(1) = .06$		$\chi^2(1) = 2.6$	$\chi^2(1) = .42$
Global Sig Regress t-test (no vs yes)	$\chi^2(1) = .05$	$\chi^2(1) = .01$	$\chi^2(1) = .62$		$\chi^2(1) = .06$	$\chi^2(1) = .69$

^a 5
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dies showed a non-zero group difference consistent with the meta-analysis in direction; 26 studies did not

^b 6 studies showed a non-zero group difference consistent with the meta-analysis in direction; 25 studies did not

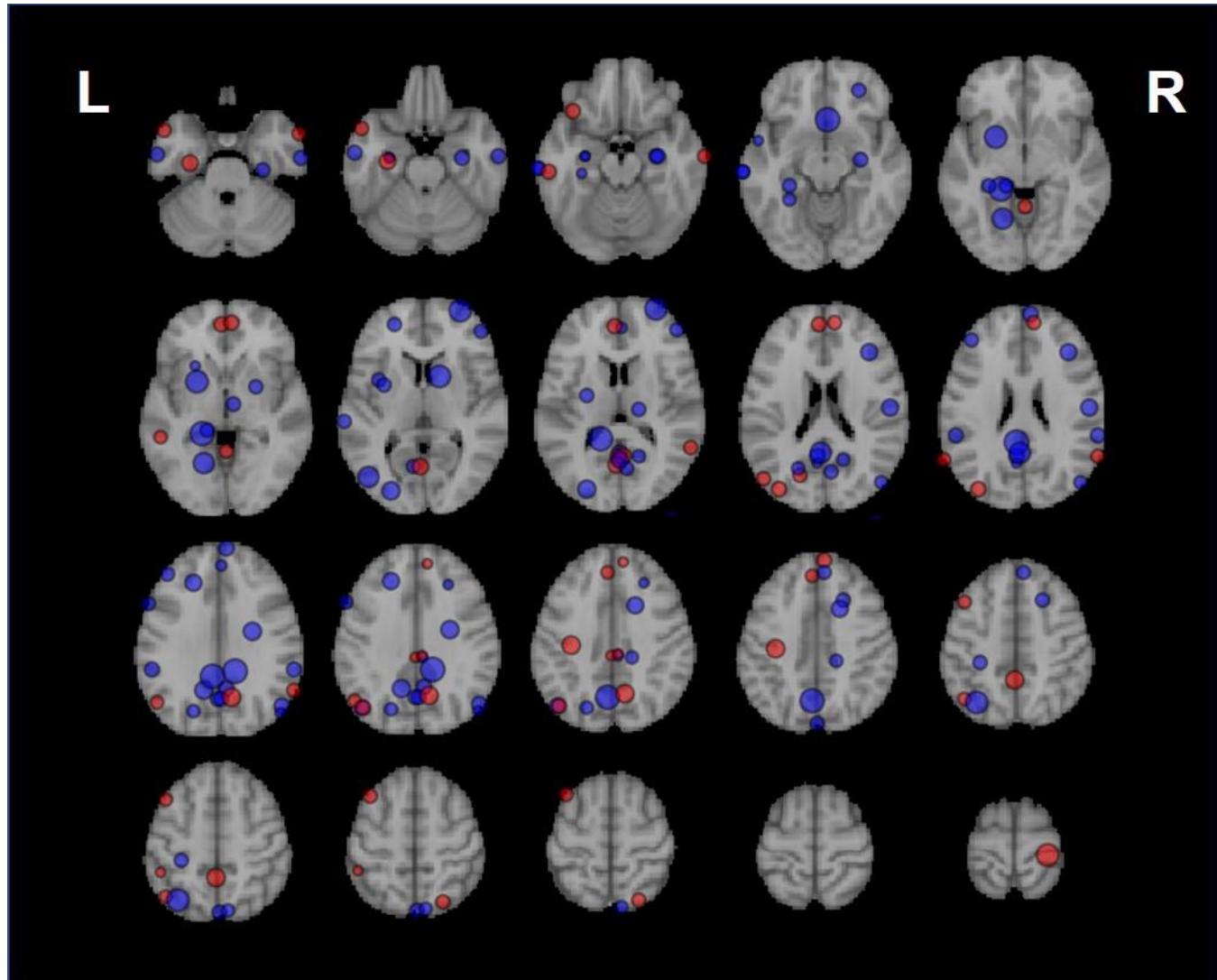
^c 5 studies showed a non-zero group difference consistent with the meta-analysis in direction; 26 studies did not

^d 16 studies showed a non-zero group difference consistent with the meta-analysis in direction; 15 studies did not

^e 6 studies showed a non-zero group difference consistent with the meta-analysis in direction; 25 studies did not

* p<0.05; positive t-values indicate higher values in studies that did NOT show an effect consistent with the meta-analysis

Supplementary Figure.



Supplementary Figure Legend. Depiction of the spatial location (MNI space) of the peak coordinates for each of the included studies in the meta-analysis (except those reporting no significant group differences). Size of the dots is scaled based on size of the study's sample. Red dots indicate HC>MCI and blue dots indicate MCI>HC.